



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2013-0890; Special Conditions No. 25-524-SC]

Special Conditions: Airbus Model A350-900 Series Airplane; Ground Pivoting Loads

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for Airbus Model A350-900 Series airplanes.

These airplanes will have a novel or unusual design feature(s) associated with a braking system that affects the airplane's pivoting behavior. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: Effective [Insert date 30 days after date of publication in the Federal Register].

FOR FURTHER INFORMATION CONTACT: Todd Martin, FAA, Airframe/Cabin Safety, ANM-115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, Washington, 98057-3356; telephone (425) 227-1178; facsimile (425) 227-1320.

SUPPLEMENTARY INFORMATION:

Background

On August 25, 2008, Airbus applied for a type certificate for their new Model A350-900 series airplane. Later, Airbus requested and the FAA approved an extension to the application for FAA type certification to June 28, 2009. The Model A350-900 series airplane has a conventional

layout with twin wing-mounted Rolls-Royce Trent engines. It features a twin aisle 9-abreast economy class layout, and accommodates side-by-side placement of LD-3 containers in the cargo compartment. The basic Model A350-900 series configuration will accommodate 315 passengers in a standard two-class arrangement. The design cruise speed is Mach 0.85 with a Maximum Take-Off Weight of 602,000 lbs. Airbus proposes the Model A350-900 series airplane to be certified for extended operations (ETOPS) beyond 180 minutes at entry into service for up to a 420-minute maximum diversion time.

The Airbus Model A350-900 series airplane is equipped with a braking system that affects the airplane's pivoting behavior. During pivoting the braking system inhibits braking on some wheels. Title 14 Code of Federal Regulations (14 CFR) 25.503 and European Aviation Safety Agency (EASA) Certification Specification (CS) section 25.503, each specify limit loads due to pivoting, however, system effects are not taken into account.

Type Certification Basis

Under Title 14, Code of Federal Regulations (14 CFR) 21.17, Airbus must show that the Model A350-900 series meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25-1 through 25-129.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the Model A350-900 series because of a novel or unusual design feature, special conditions are prescribed under § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Model A350-900 series must comply with the fuel-vent and exhaust-emission requirements of 14 CFR part 34 and the noise-certification requirements of 14 CFR part 36 and the FAA must issue a finding of regulatory adequacy under § 611 of Public Law 92-574, the “Noise Control Act of 1972.”

The FAA issues special conditions, as defined in 14 CFR 11.19, under § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The Airbus Model A350-900 series airplane will incorporate the following novel or unusual design features: a braking system that affects the airplane’s pivoting behavior.

Discussion

Within the Aviation Rulemaking Advisory Committee, the Loads and Dynamics Harmonization Working Group developed criteria for determining pivoting loads. The group recommended, for airplanes with more than two main landing gear units, a rational pivoting maneuver that takes into account the effects of the braking system and tire characteristics, in lieu of the current requirement. Although the Airbus Model A350-900 series airplane has two main landing gear units, EASA and the FAA propose to apply the same criteria on this airplane.

These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

Discussion of Comments

Notice of proposed special conditions No. 25-13-10-SC for Airbus Model A350-900 series airplanes was published in the *Federal Register* on October 29, 2013 (78FR64415). The

Boeing Company submitted one comment, which stated that “there is not a specific requirement to consider failure modes. Failure modes of the brake system that would cause brakes to be applied during pivoting should be investigated in accordance with the requirements relating to systems and structures interaction. We suggest that the FAA consider revising the proposal to include this specific requirement.”

Failure modes of the braking system are addressed by a separate special-conditions document titled *Interaction of Systems and Structures*, published in the *Federal Register* on December 20, 2013 (78FR76980). The *Interaction of Systems and Structures* special conditions requires that the effects of system failures be taken into account, and specifically addresses the pivoting requirement, § 25.503, and any special condition used in lieu of § 25.503.

This (i.e., current) special conditions document addresses loads associated with structural design not specific to a failure condition.

Applicability

As discussed above, these special conditions apply to Airbus Model A350-900 series airplanes. Should Airbus apply later for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on the Airbus Model A350-900 series airplanes. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Airbus Model A350-900 series airplanes in lieu of § 25.503:

1. The main landing gear and supporting structure must be designed for the loads induced by pivoting during ground maneuvers.
 - a. The following rational pivoting maneuvers must be considered:
 - i. Towing at the nose gear at the critical towing angle with no brakes applied, including cases with torque links disconnected; and separately,
 - ii. Application of symmetrical or unsymmetrical forward thrust to aid pivoting, with or without braking by pilot action on the pedals.
 - b. The airplane is assumed to be in static equilibrium, with the loads being applied at the ground contact points.
 - c. The limit vertical load factor must be 1.0, and:
 - i. For wheels with brakes applied, the coefficient of friction must be 0.8,
 - ii. For wheels with brakes not applied, the ground tire reactions must be based on reliable tire data.

Issued in Renton, Washington, on April 25, 2014.

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